

Appendix A. Sample of Precedent Policies and Incentives

Location	Policy Type	Details	Links	Development process
Chicago	Density bonus	The floor area bonus for qualifying green roofs is calculated as follows: Bonus FAR = (area of roof landscaping in excess of 50% of net roof area ÷ lot area) × 0.30 × Base FAR.	Zoning code	Interest in green roofs in Chicago began when Mayor Daley visited Europe in 1998 and noticed the large number of green roofs. In 2003, the city Department of Environment designed and installed a 1,886 m ² (20,300 sq. ft.) demonstration project on the roof of City Hall. Other city-sponsored green roof projects that year were the Chicago Center for Green Technology and the Chicago Transit Authority Substation as well as a few city fire stations. In 2003, to encourage the private sector to play a leadership role in establishing green roofs, the Department of Planning and Development engaged the Chicago Urban Land Institute (ULI) a non-profit organization of real estate professionals, to hold seminars on green roofs to dispel fears and misconceptions about green roofs. Similarly, professionals were surveyed to determine what incentives would be most attractive for them to install green roofs.
	Financing / Requirement	Most projects that receive public financing or are subject to planning department review are required to have at least 25% green roof.	Matrix	
	Grant reimbursement	Green Roof Improvement Fund: Eligible projects in Central Loop Area TIF district can receive reimbursement grant for up to 50% of GR cost (up to \$100k). Eligible project selection criteria: 1) match funding that exceeds 50% of the Eligible Costs; 2) a vegetated area that covers more than 50% of the net roof area of the building; 3) a design that includes a palette of plants that are drought tolerant and minimize the need for irrigation; 4) a Green Roof that is highly visible to nearby buildings; and 5) a plan to collect Green Roof performance measurements for storm water and urban heat island mitigation	GRIF program	
	Grant reimbursement	Green Roof Grant Program: up to \$5,000 for residential/commercial applications.	Green Roof Grant Program	
Portland	Density bonus	FAR bonus based on three ranges of ecoroof coverage in relation to the building's footprint: 10-30%, 30-60% and 60% or greater earns one, two and three square feet of additional floor area per square foot of ecoroof respectively.	Zoning code	Portland is the first city in the U.S. to pass legislation promoting green roofs, the result of the requirement to conform with the Clean Water Act. One response was to develop strategies that would increase surface water absorption and reduce imperviousness around developments. Portland began to research ecoroofs as a stormwater management tool in the mid 1990s. Encouraged by the results of the research, the city funded an ecoroof demonstration exhibit at the Portland Home and Garden Show. City officials surveyed public opinion at the show and found that 75% of responses were favorable. Based on these results, the City funded, from stormwater fees, two green roof test sites: the 10-storey Hamilton Apartments and five-storey Buckman Terrace. The successful outcomes from the two test sites encouraged the city to promote ecoroofs as a stormwater management tool. Ecoroofs have been formally recognized as a best management practice in the City's stormwater manual since 1999.
	Grant reimbursement	Up to \$5 per square foot for ecoroof projects to manage stormwater, very few design requirements.	Summary	
	Green Building Policy	All new City-owned facilities to include an ecoroof with at least 70% coverage AND high reflectance, Energy Star-rated roof material on any remaining non-ecoroof roof surface area; OR, Energy Star-rated roof material when an integrated ecoroof/Energy Star-rated roof is impractical and ll roof replacement projects on City-owned facilities shall install an ecoroof AND high reflectance, Energy Star-rated roof on any remaining non-ecoroof roof surface area; OR, when an integrated ecoroof/Energy Star-rated roof is impractical, install an Energy Star-rated roof	Green Building Policy	
	Stormwater fee offset	Clean River Rewards: Portland bills a monthly stormwater management charge and a stormwater system development charge. If you manage stormwater on your property, you can receive up to a 100% discount on your on-site stormwater management charges. For commercial properties, the discount is based on managing stormwater runoff from both roof and paved areas. Ecoroofs and Roof gardens (intensive) both qualify for percentage discount.	Clean River Rewards	

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	Stormwater code	Ecoroofs replace impervious area at a 1:1 ratio.	Stormwater code	
Minneapolis	Stormwater fee offset	To encourage green roofs, the system offers a 100% abatement for each square foot of green roof that offsets a parcel's estimated amount of impervious surface. The 100 percent abatement is granted even for extensive green roof systems that do not hold more than 80 percent of the average rainfall from all rainfall events.	Stormwater utility	In 2005, established stormwater utility to charge separately. Concurrently implemented program whereby property owners could qualify for fee reductions by establishing onsite water-quality and/or -quantity treatment systems, such as rain gardens, dry wells, pervious pavement, ponds and green roofs.
New York	Tax credit	One-year tax abatement of \$4.50 per square foot of green roof, up to a maximum of \$100,000 for the entire job. For co-op / condo buildings. Green roof must have at least 2 inches of growing media and cover at least half of the total roof area. Pilot program, sunsets in 5 years.	Bill summary	In New York, the promotion of green roofs has been primarily through the efforts of Earth Pledge, which has undertaken several green roof initiatives. To support government evaluation of locally appropriate green roof infrastructure and policy support structures, Earth Pledge has: done research to quantify the costs and benefits of green roofs for New York; educated the stakeholders whose participation is crucial to achieving widespread green roof development in New York; and implemented green roof projects. Tax abatement was announced as part of city's sustainability plan (PlanNYC) and codified in a bill signed 8/5/08. Coalition of over 50 organizations collaborated to push for passage of the tax abatement legislation. Tax credit type of incentive was seen by the coalition as a cost-effective cost-sharing program that would stimulate the market for green roofs and cover the public benefits of green roofs.
District of Columbia	Grant reimbursement	DC Greenworks received a grant from the District Department of the Environment, Watershed Protection Division to provide green roof demonstration subsidies of up to \$3 per square foot, with a \$12,000 pr project cap. These are intended as pilot projects to demonstrate the technology, encourage its use and illustrate the feasibility of green roofs to help manage storm water. Appears to be funded on a year-to-year basis.	DC Greenworks Program overview	Alexi Boado, low-impact development coordinator for Washington, DC's District Department of the Environment (DDOE), says the city began seriously examining green roofs for stormwater control five years ago, when the DC Water and Sewer Authority provided \$300,000 for green roof development as part of a court-ordered settlement. Those funds, managed by the nonprofit Chesapeake Bay Foundation, seeded a program of incentive grants that encouraged eight builders to choose green roofs over other traditional devices as their primary stormwater control device (stormwater control plans are required for any new construction or redevelopment of more than 5,000 square feet in the District).
	Expedited processing	By DDOE, for designs that include a green roof in the stormwater control plan.		
Philadelphia	Tax credit	One -year business privilege tax credit for 25% of total cost (up to 100k) for GRs 50%+ total roof area or 75% available roof area (whichever greater).	Bill Application for Tax Credit	

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Cincinnati	Financing	\$5 million in loans per year at 3% below market rates to cover incremental cost of green roofs. Pending approval from Ohio EPA.	Summary and application	
	Grant reimbursement	Competitive grant program administered by Metropolitan Sewer district. For green roofs and other stormwater management BMPs	Summary and application	
Toronto	Grant reimbursement	\$50 per square meter reimbursement. Maximum of \$10,000 per single family or \$100,000 per all other building types. Requirements for eligible projects are more specific than other cities.	Program information	The city's involvement in green roofs goes back to the recommendations of the 2001 environmental plan, which first identified the need for a strategy to encourage green roofs and rooftop gardens. The natural environment policy within the city's new official plan supports "the development of innovative green spaces such as green roofs and designs that will reduce the urban heat island effect." Extensive technical research (Ryerson/NRC) and cost-benefit analyses were conducted before policy implemented. Original incentive was \$10 per square meter; increased after the first year.
Tokyo	Requirement	Ordinance on natural preservation: requires at least 20 per cent of a roof to be greened in new developments or extensions to existing developments larger than 1,000 m ² (10,764 sq. ft.) for private developments and 250 m ² (2,691 sq ft.) for public developments. Failure results in a penalty of approximately 200,000 yen (\$2,000 US).		Tokyo's severe urban heat island effect forced the municipal government to respond. Unlike European jurisdictions, the TMG instituted green roof requirements without much research or cost justification. The TMG was able to create regulations based on the precautionary principles without the typical obstacles to policy development, such as research and public support.
Germany	Requirement	Federal Ecological Compensation and Replacement Measure states that environmental disturbances must be avoided, minimized or mitigated. The policy is administered at the state or local level, so the integration of green roofs is not consistent. However, many states/cities count green roofs as a "replacement" measure.		
Stuttgart	Grant reimbursement	Pays for 50% of initial costs, or up to a maximum of €17.90 per square meter. €51,000 available per year. Instituted in 1983.		See: Lawlor, G et. al. 2006. Green Roofs: A Resource Manual for Municipal Policy Makers. Canadian Mortgage and Housing Corporation.
	Requirement	Local development plans first regulated green roofs in 1985, in an industrial area called Weiler Park. The regulation states that all flat roofs and roofs sloped eight to 12 degrees must be extensively greened with a minimum growing-medium depth of 12 cm (4.7 in.). This requirement appears to be limited to certain developments only.		

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	Regulation	Through the Federal Ecological Compensation and Replacement Measure, described above. Ecological compensation and replacement analysis is similar to Green Factor in that point values are assigned to different types of vegetation and a site total is calculated. If the total is less than a certain percentage, a replacement measure must be implemented at an off-site location.		
Munster	Stormwater fee offset	<p>If a green roof is installed, the stormwater fee is reduced by 80 per cent to €0.09/m² of green roof per year. A green roof with high retention incurs a charge of only €0.04 m². There are also fee reductions for retention ponds, infiltration systems and removal of impervious surfaces.</p> <p>Previously had a reimbursement incentive for €15/m², but was phased out in 2002 due to lack of funds.</p>		See: Lawlor, G et. al. 2006. Green Roofs: A Resource Manual for Municipal Policy Makers. Canadian Mortgage and Housing Corporation.